CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.04/KRIDL/CSR-01/740e/CUBE/2014-15 20.02.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager (West),** KRIDL, Bangalore.
* Name of the work	: Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
* Sample ID	: Drain Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 20.02.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	23.01.2015	20.02.2015	8.135	478.3	21.26
2	23.01.2015	20.02.2015	8.290	489.3	21.75
3	23.01.2015	20.02.2015	8.306	512.3	22.77

* Information is furnished by the Customer/Representative

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VISHWANATH .C
Quality Manager

AE-04

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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T-2377

Job No.: CTCE/BBMP/W.No.04/KRIDL/CSR-01/740c/CUBE/2014-15 21.02.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager (West),** KRIDL, Bangalore.
* Name of the work	: Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
* Sample ID	: Drain Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 21.02.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	24.01.2015	21.02.2015	8.150	475.5	21.13
2	24.01.2015	21.02.2015	8.280	492.6	21.89
3	24.01.2015	21.02.2015	8.340	502.3	22.32

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Quality Manager

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/W.No.04/KRIDL/CSR-01/740e/CUBE/2014-15 24.02.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
* Agency	: Technical Manager (West), KRIDL, Bangalore.
* Name of the work	: Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
* Sample ID	: Drain Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 24.02.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	27.01.2015	24.02.2015	8.112	489.3	21.75
2	27.01.2015	24.02.2015	8.290	496.8	22.08
3	27.01.2015	24.02.2015	8.312	519.3	23.08

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VISHWANATH .C
Quality Manager

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com

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Job No.: CTCE/BBMP/W.No.04/KRIDL/CSR-01/740c/CUBE/2014-15 19.02.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager (West),** KRIDL, Bangalore.
* Name of the work	: Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
* Sample ID	: Covering Slab Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 19.02.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	22.01.2015	19.02.2015	8.180	478.6	21.27
2	22.01.2015	19.02.2015	8.295	510.2	22.68
3	22.01.2015	19.02.2015	8.345	526.3	23.39

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VISHWANATH .C
Quality Manager

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.
Tele Fax : 23223227, Website : www.civiltechconsultants.com
E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No: CTCE/BBMP/W.No.04/KRIDL/WMM/AIV/2014-15 20.01.2015

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	20.01.2015

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	387	388	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	303	
4	Aggregate Impact value = percent fines	21.71	21.91	
	$100^* (W_2/W_1)$%			21.81

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

#23/14, 7th Cross, 3rd Stage, 4th Block, Shakthi Ganapathi Nagara, Basaveshwaranagar, Bangalore-79.

Tele Fax : 23223227, Website : www.civiltechconsultants.com

E-mail : vishwanath.ia@civiltechconsultants.com / info@civiltechconsultants.com

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Job No.: CTCE/BBMP/W.No.04/KRIDL/WMM/S-1/2014-15 20.01.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of Work	Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	20.01.2015

Result : Flakiness Index = **11.26%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **24.51%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

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Lab No: CTCE/BBMP/W.No.04/KRIDL/SDBC/AIV/2014-15 23.02.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.02.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	379	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	77	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	303	
4	Aggregate Impact value = percent fines $100^* (W_2/W_1)\%$	20.58	20.26	20.42

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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4th Block, Shakthiganapathinagara,
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Bangalore-560079.

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Job No.: CTCE/BBMP/W.No.04/KRIDL/SDBC/Shape_T/2014-15 : 23.02.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager (West),** KRIDL, Bangalore.
Name of Work	: Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 23.02.2015

Result : Flakiness Index = **12.35%**

Elongation Index = **13.26%**

Result : Combined Flakiness & Elongation index **25.61%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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23/14, 7th Cross, 3rd Stage,
4th Block, Shakthiganapathinagara,
Basaveshwaranagar,
Bangalore-560079.

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Job No.: CTCE/BBMP/W.No.04/KRIDL/SDBC/Stripping/2014-15 23.02.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the work	Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	23.02.2015

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.00 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.04/KRIDL/SDBC/Sp_W$_4$/2014-15 23.02.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka New Town Sub Division, BBMP, Bangalore.
Agency	**Technical Manager (West),** KRIDL, Bangalore.
Name of the Work	Improvements to drains and asphalting to roads in between 26th Main to 21st Main in Judicial Layout in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNTSD/141/2014-15 Dated: 19.01.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	23.02.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2011	2012	2014	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1256	1257	1259	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2018	2021	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_5)$ g	760	761	762	
6	Weight of oven dried aggregate	W_4 g	1995	2000	2007	
7	Specific Gravity	$W_4/(W_3-W_5)$	2.625	2.628	2.634	2.629
8	Apparent Specific gravity	$W_4/(W_4-W_5)$	2.700	2.692	2.683	2.692
9	Water Absorption	$((W_3-W_4)*100)/W_4$	1.05%	0.90%	0.70%	0.88%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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